REMARKS

This communication is in response to the Final Office Action of July 24, 2008.

The Examiner objected to claim 25. Applicant has made the indicated correction.

The Examiner has rejected claims 1, 21 and 25 under 35 U.S.C. 103(a) as being unpatentable over Giemborek et al. (US 6,950,105), in view of Williams et al. (US 6,397,343), and further in view of Bose et al. (US 7,076,681). The Examiner has rejected claims 28-30 under 35 U.S.C. 103(a) as being unpatentable over Giemborek et al. (US 6,950,105), in view of Williams et al. (US 6,397,343), and further in view of Bose et al. (US 7,076,681), as applied to claims 1, 21, and 25 above, and further in view of Culbert et al. (US 6,820,209).

In the amendment of March 25, 2008, Applicant pointed out that Bose taught away from the claimed invention because in Bose a stall in a stage results in a reduction in the clock rate to cut down the rate at which instructions are received by the stalled stage. In Bose, when an E-unit senses a stall condition, a stall bit is asserted to reduce the clock speed to throttle down the instruction rate to an E-unit, as described in column 6, lines 36-48. Applicant pointed out that in contrast in the claimed invention the performance level (and hence the clock rate) is increased when there is a high percentage of clock cycles for which there is a stall. However, in a graphics system the "stall" is in regards to a stage waiting for data from an upstream stage. In a graphics pipeline a stage can become stalled waiting for data from an upstream stage. When the clock rate is increased the upstream stages improve their throughput, reducing the percentage of clock cycles in which the downstream stage(s) are stalled.

On page 4 of the Final Rejection, the Examiner stated that he had not found persuasive the argument that Bose taught away from the claimed invention because "applicant's claims do not specify that the clock rate of the pipeline is increased in response to a detected stall."

In response to the Examiner's comments, Applicant has made a clarifying amendment to the claims to clarify that the clock rate of the graphics pipeline is increased when the percentage of clock cycles for which there is a stall exceeds a first threshold level. Applicant has also made a clarifying amendment to clarify that the clock rate of the graphics pipeline is decreased when the percentage of clock cycles for which there is a stall is no greater than a second threshold level, where the second threshold level is less than the first threshold level. Entry and reconsideration is respectfully requested.

As the Examiner has observed on page 5 of the Final Rejection, "Giemborek doesn't

describe monitoring utilization of a graphics pipeline." However, Williams doesn't monitor the percentage of clock cycles for which there is a stall to determine whether the pipeline is under-utilized or over-utilized. Moreover Williams doesn't increase the clock rate when the percentage of clock cycles for which there is a stall exceeds a first threshold and decrease the clock rate when the percentage of clock cycles for which there is a stall is no greater than a second threshold, the second threshold being less than the first threshold. In contrast, as previously observed, Williams merely monitors gross load. Moreover, the objective in Williams is always to run the graphics system as fast as possible, as described in column 6, lines 26-32. As previously described, Bose teaches away from the limitations of the amended claims. Consequently, it is respectfully submitted that the combination of references fails to teach or suggest all of the elements of the amended claims.

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is now in condition for allowance. The Examiner is invited to contact the undersigned if there are any residual issues that can be resolved through a telephone call.

The Commissioner is hereby authorized to charge any appropriate fees to Deposit Account No. 50-1283.

Respectfully submitted,
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